Forest Sciences

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Pine mushroom habitat in the Prince Rupert Forest Region

Pine mushrooms (*Tricholoma magnivelare*) are a valuable commercial product from western hemlock forests of the Prince Rupert Forest Region. For example, in 1994, an estimated 136,000 kg of pine mushrooms were collected in the Nass Valley, with estimated revenues of $3,755,400. As well, many of the pickers (~70%) were residents of the Nass Valley, Terrace and Kitimat area. The economic benefits to local communities of the pine mushroom has resulted in more public interest in forest management, especially the potential conflict where commercial timber and commercial mushroom harvesting are both possible. To address some of these concerns, we first need to know where pine mushrooms occur, and whether their habitat is consistent enough to allow us to identify potential mushroom locations in forest operations. In this extension note, we summarize the characteristics of pine mushroom habitat (the types of forests and soils where the pine mushroom grows) from forests across the Kalum and Kispiox districts.

Twenty-one sites in the ICHmc1, ICHmc2, and CWHws1 biogeoclimatic units, mainly in the

Forest Sciences, Prince Rupert Forest Region
Bag 5000, Smithers, BC V0J 2N0 847-7500 (FAX 847-7217)

Hazelton, Kispiox, Terrace, and Cranberry - Meziadin areas, were located with the assistance of experienced mushroom pickers. The fieldwork took place in September, when we could find pine mushrooms and confirm habitat suitability. At each site we described the soils, vegetation and stand characteristics where the pine mushrooms were found.

The sites ranged in elevation from 140 to 625 m, and were located on all aspects, including level terrain (Table 1). Landforms were glaciofluvial terraces (or kames), or morainal mantles (blankets and veneers) over bedrock. Soils were well to very rapidly drained, and generally coarse in texture, often with a high coarse fragment content. These soils often had a characteristic grey-coloured Ae soil horizon at the surface. Forest floors tended to be relatively thin (~ 5 cm), mor-type humus forms. Due to this combination of soil and site features, soil moisture regimes were drier than average and soil nutrient regimes in most cases poorer than average for the biogeoclimatic subzone and variant.

Western hemlock (*Tsuga heterophylla*) was consistently the dominant tree species, and lodgepole pine (*Pinus contorta*) was frequently, though not always, present in the tree layer. Shrub layers were typically sparse (< 2% cover), as were herbs (< 1% cover), with species such as black huckleberry (*Vaccinium membranaceum*), falsebox (*Paxistima myrsinites*), false azalea (*Menziesia ferruginea*), prince's-pine (*Chimaphila umbellata*), twinflower (*Linnaea borealis*), bunchberry (*Cornus canadensis*), and rattlesnake plantain (*Goodyera oblongifolia*). In most, but not all plots, there was a high coverage of weft-forming mosses (> 90% cover), usually dominated by step-moss

TABLE 1. Summary of environmental attributes

Ecological classification			
Biogeoclimatic unit	**ICHmc1**	**ICHmc2**	**CWHws1**
Site series and phase	01b Hw - Step moss (Submesic) (5[a])	01b Hw - Step moss (Submesic) (9[a])	03a HwPl - Feathermoss (Glaciofluvial) (5[a]) 03a HwPl - Feathermoss (Typic) (2[a])
Ecosection	Nass Basin	Nass Basin, Nass Ranges	Nass Ranges, Kitimat Ranges
Site attributes			
Elevation (m)	140–460	320–625	120–250
Aspect (degrees)	variable	none – variable	none to variable
Slope (%)	0–50	0–30	0–80
Meso slope position [b]	upper and crest, middle, lower	upper and crest, middle, level	level and upper–crest, middle
Soil attributes			
Moisture regime	3	3	2–3
Nutrient regime	B	B	B
Drainage class [b]	rapidly – well	rapidly – well	very rapidly – well
Texture (0–30 cm)[b]	sandy loam – loamy sand	sandy loam, loamy sand, loam	loamy sand – sandy loam
Coarse fragments	0–60%	20–70%	0–80%
Soil Classification			
Terrain [b]	morainal veneer, morainal blanket, glaciofluvial blanket	morainal blanket, morainal veneer, glaciofluvial terrace	glaciofluvial blanket, morainal mantles of various thickness
Soil pedon [b]	Orthic Humo-Ferric Podzol, Eluviated/Orthic Dystric Brunisol	Orthic Humo-Ferric Podzol, Eluviated Dystric Brunisol	Orthic Humo-Ferric Podzol, Orthic and Eluviated Eutric Brunisol
Humus form [b]	Hemimor	Hemimor	Hemimor, Humimor
Stand Characteristics			
Net volume (m^3)	317 (201 – 504)[c]	475 (294 – 599)	387 (133 – 719)
Basal area (m^2)	53 (41 – 67)	61 (50 – 76)	51 (32 – 81)
Site index (m@50 year)	Hw 10.3 (5.9 – 18.4) Pl 12.6 (9.5 – 15.3)	Hw 12.6 (6.9 – 22.1)	Hw 11.7 (6.9 – 15.5) Pl 15.5 (11.7 – 18.5)

[a] Number of plots in which the ecosystem unit occurred.
[b] Listed in order of prevalence.
[c] Average (range in brackets)

(*Hylocomium splendens*) and red-stemmed feathermoss (*Pleurozeum shreberi*).

In the ICHmc1 and -mc2 variants, all sites were classified as the 01b Hw - Step moss site series, submesic phase, and in the CWHws1, as the 03a and 03b HwPl - Feathermoss site series, glaciofluvial and typic phases. The pine mushroom can also occur on zonal sites, but pickers felt that the best ground, where commercial harvests occur, will be found in the drier, poorer site series described here.

Stand characteristics were less consistent than soils and vegetation. We found pine mushrooms in both mixed-age stands, with veterans in the overstory, and even-aged stands. Stand ages ranged from 70 to 230 years, with most sites in the 80 to 160 year range. We could not determine how the relative abundance of pine mushrooms changes with stand age. The youngest stand we sampled in this study was 70 years, but the pine mushroom has been found in younger stands. Likewise, pine mushrooms occur in old-growth stands, although most pickers feel mushroom productivity has declined in these stands. Average site indices for western hemlock ranged from 10.3 to 12.6 m @ 50 years, which was lower than the site index predicted for zonal sites (15 to 20 m @ 50 years in the ICH and CWH subzones, respectively). Net volumes ranged widely, from 133 to 719 m^3/ha, and on average were less volumes than would be found on zonal sites. Stand health was good in most cases, but some stands had a high incidence of conks on western hemlock, especially on older trees.

With this habitat information, we can identify stands where pine mushrooms are likely to occur. Currently we do not know the extent of these site series across the merchantable forests of the Kispiox and Kalum districts. This will be addressed in future work, with the hope that better information on the extent and location of potential habitat will enable forest managers and the public to plan forest development that can accommodate both timber and mushroom harvests.

Suggested Reading

Gamiet, S., H. Ridenour, and F. Philpot. 1998. An overview of pine mushrooms in the Skeena-Bulkley Region. Northwest Institute for Bioregional Research, Smithers, BC.

Trowbridge, R., A. Macadam, and M. Kranabetter. 1999. Ecological description and classification of highly productive pine mushroom sites in northwestern British Columbia. Northwest Institute for Bioregional Research, Smithers, BC.